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(54) **STEERING DEVICE FOR A VEHICLE**

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B62D 1/06	(2006.01)
B60H 1/00	(2006.01)

(52) **U.S. Cl.**

CPC ***B62D 1/105*** (2013.01); ***B60H 1/00292*** (2013.01); ***B62D 1/065*** (2013.01); *B62D 1/16* (2013.01)

(58) **Field of Classification Search**

CPC B62D 1/105; B62D 1/16; B60H 1/3407; B60H 1/247

USPC ..... 74/492, 493, 494, 496, 498, 552; 454/152; 237/12.3 A, 123 A

See application file for complete search history.

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(57) **ABSTRACT**

A steering device for a vehicle comprises a steering wheel including a central part arranged for facing a driver and a rim that can be rotated in order to steer the vehicle, the steering wheel further comprising air dispensing means for directing an air flow towards the driver.

10 Claims, 6 Drawing Sheets

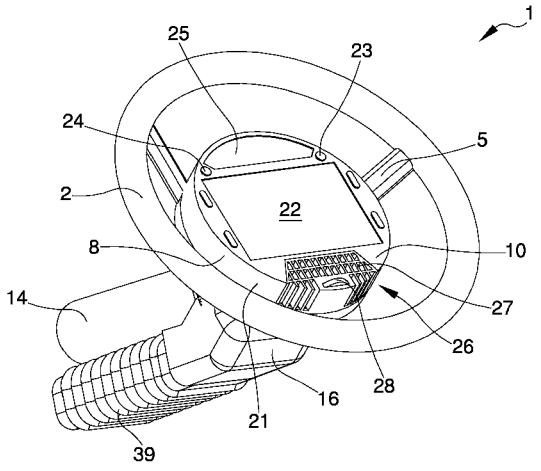
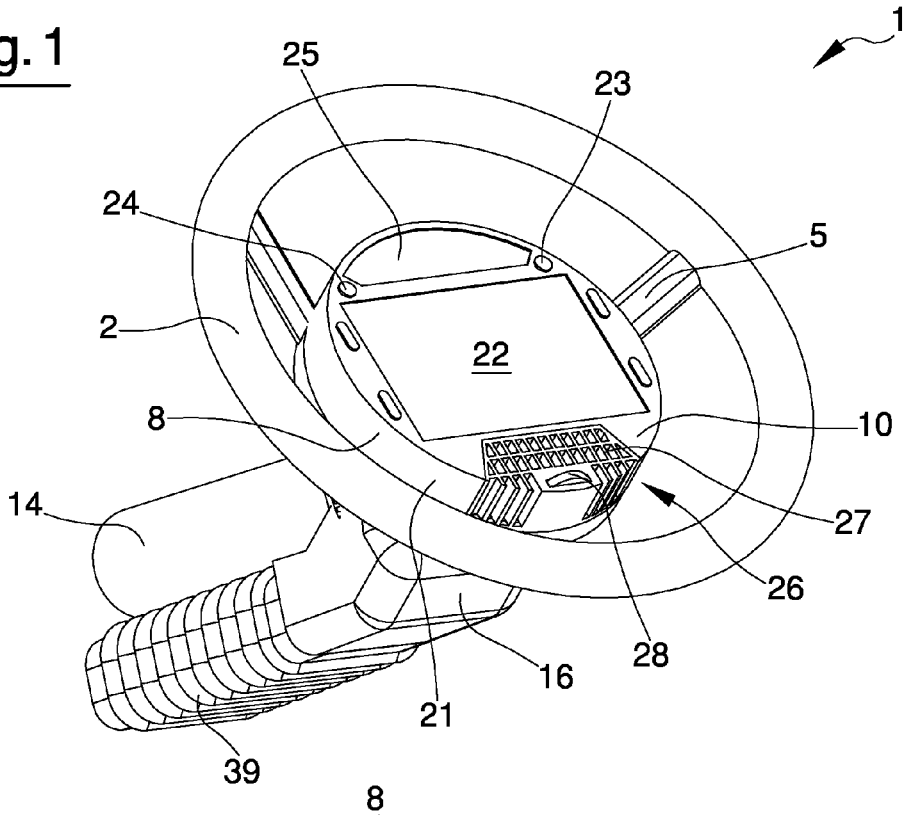


Fig. 1



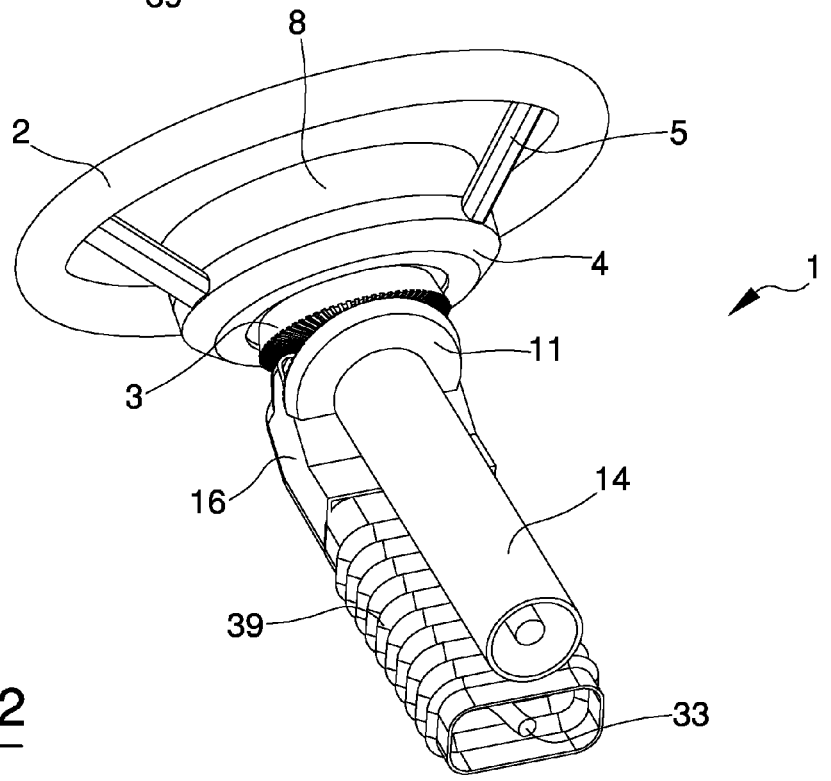


Fig. 2

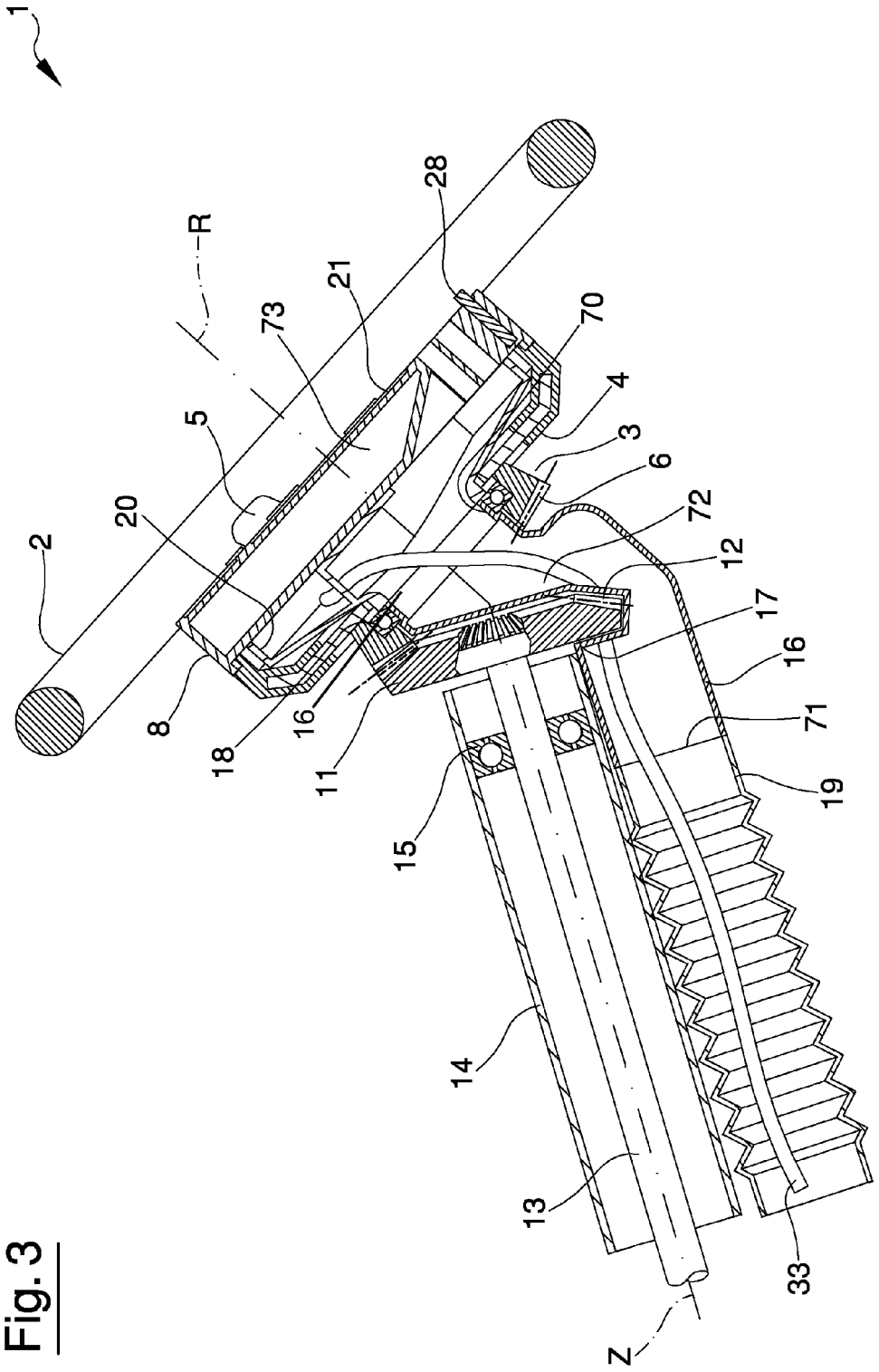


Fig. 3

Fig. 4

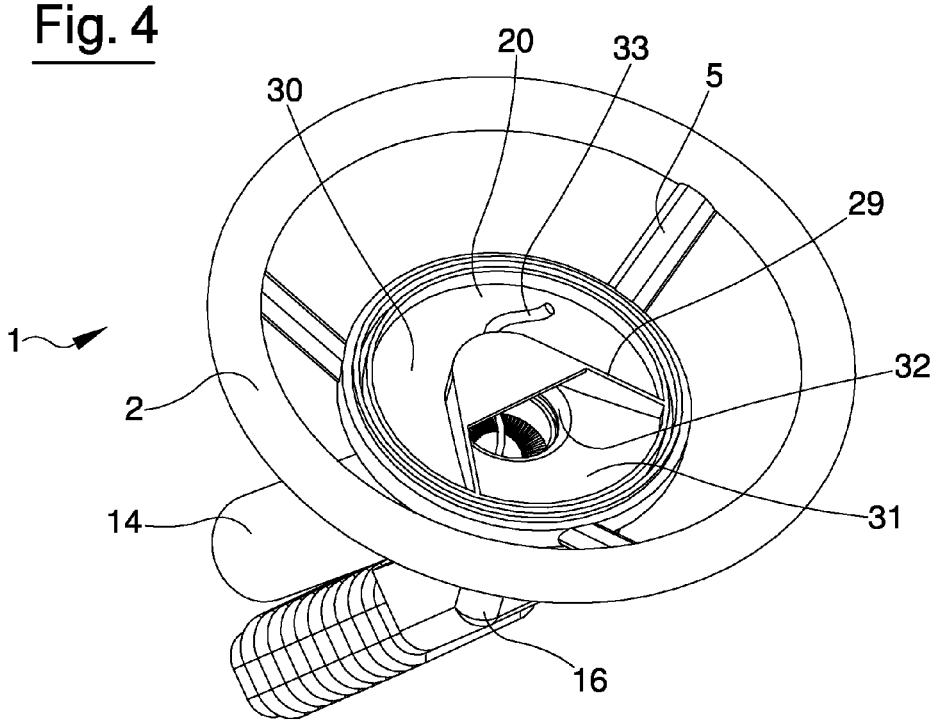
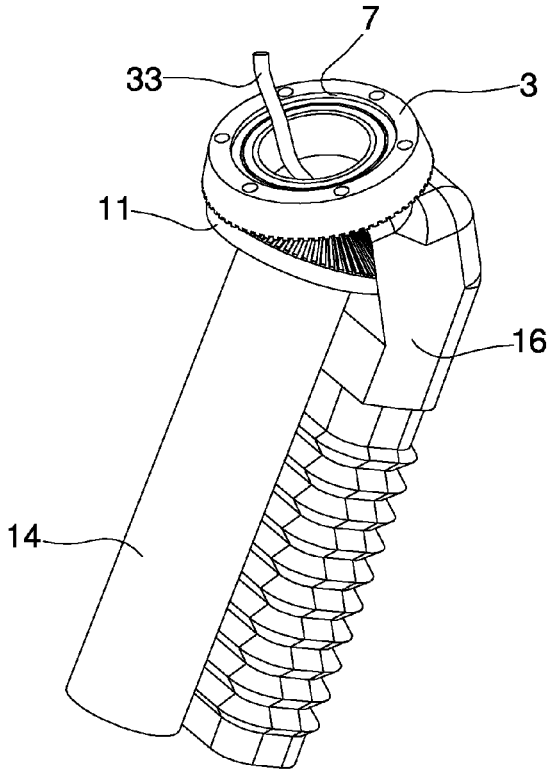


Fig. 5



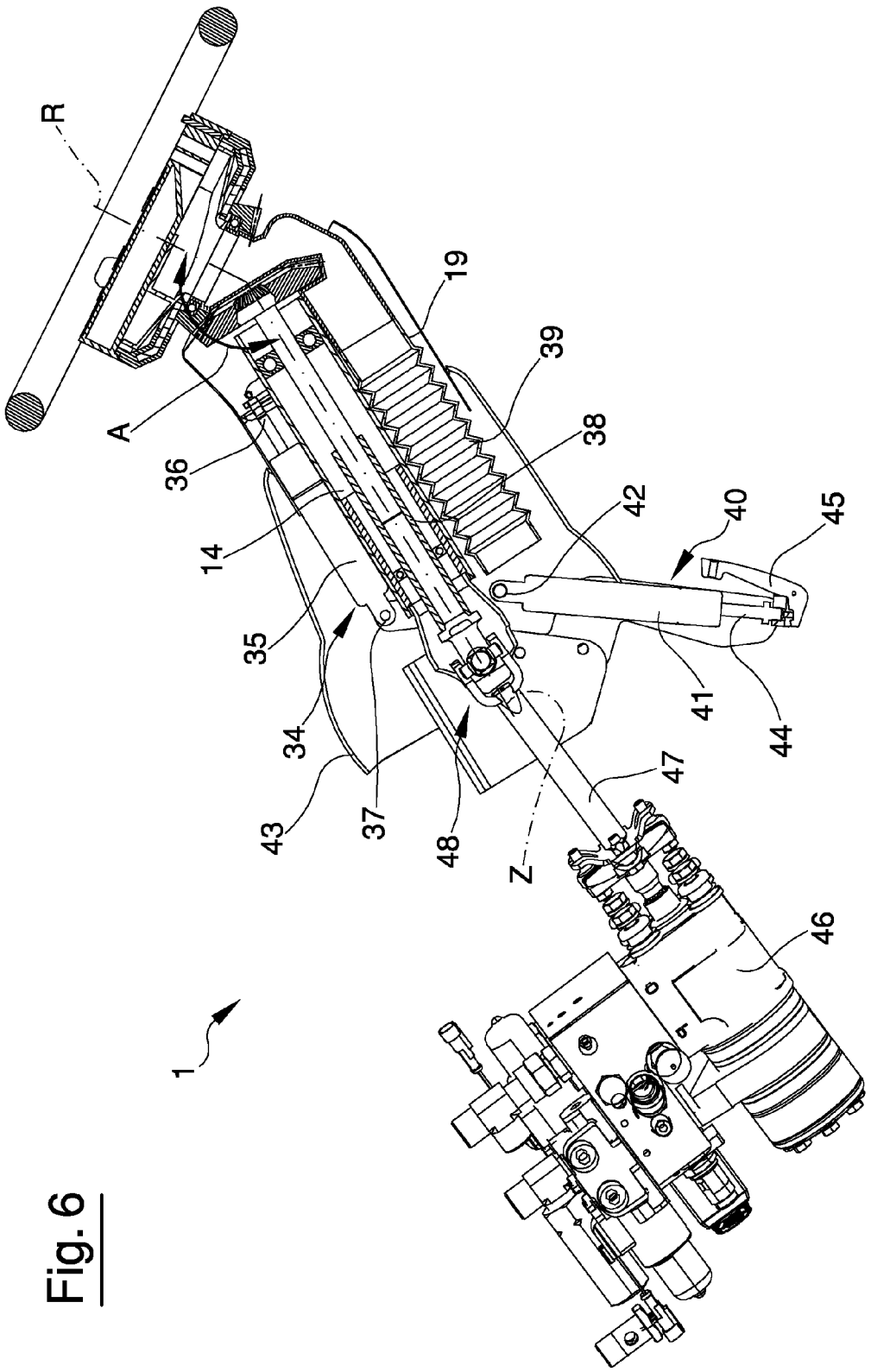


Fig. 6

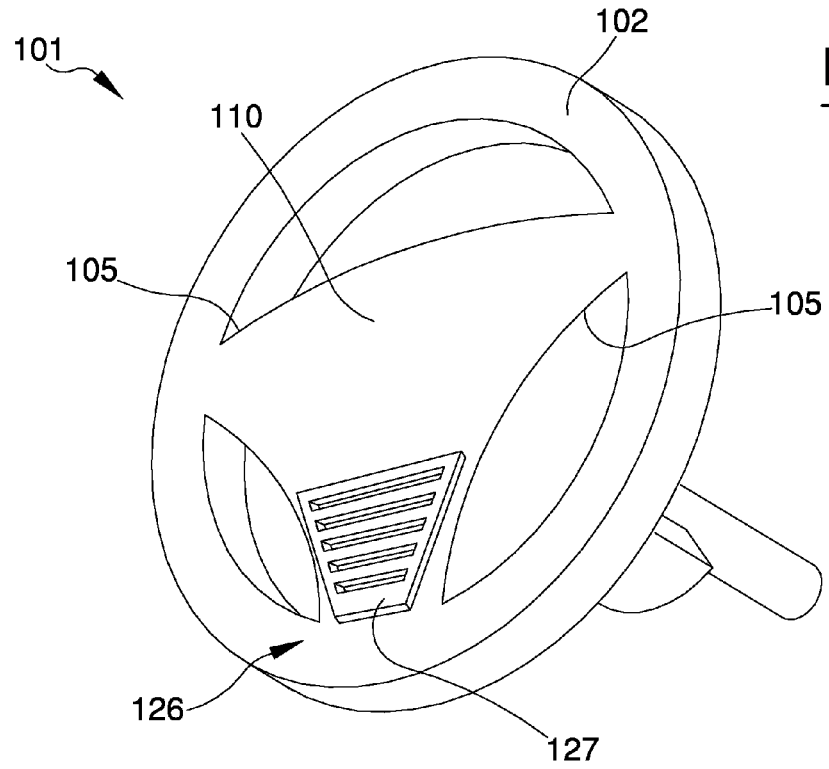

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Fig. 7

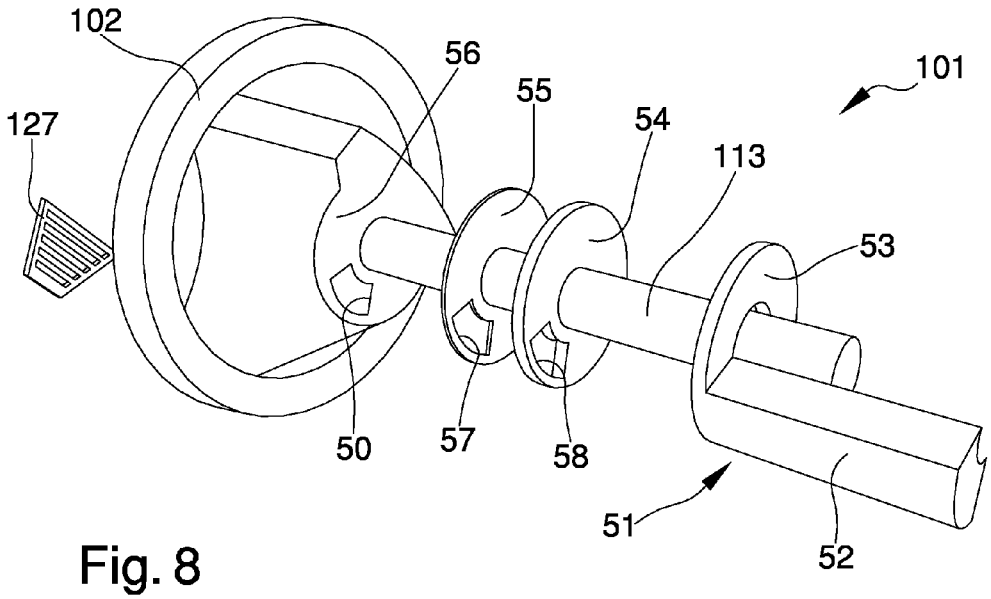
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Fig. 8

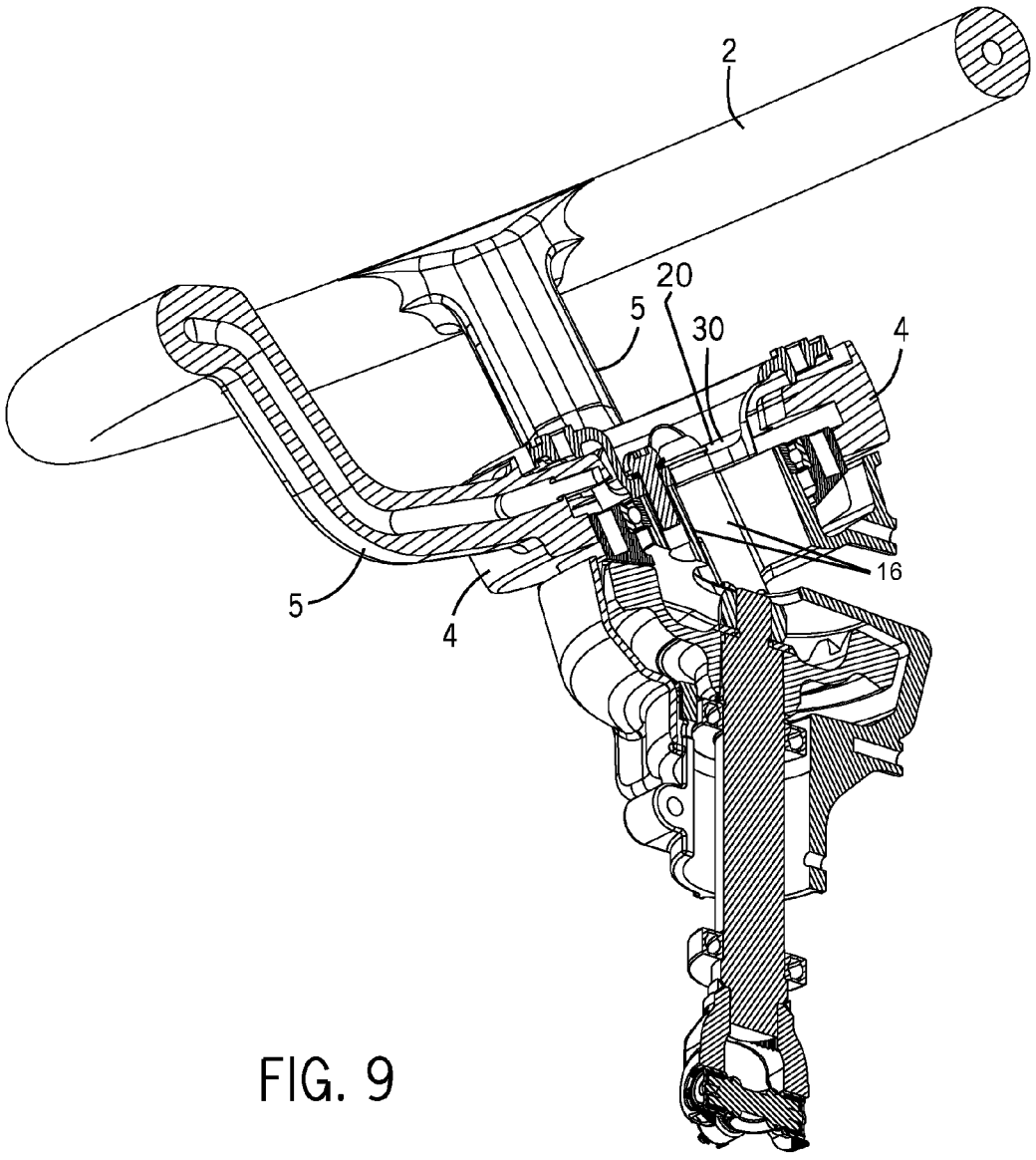

FIG. 9

STEERING DEVICE FOR A VEHICLE

CROSS REFERENCE TO RELATED APPLICATIONS

This application claims priority to Italian Patent Application Serial No. MO2012A000125, entitled, "A steering device for a vehicle," filed May 11, 2012, which is incorporated by reference herein in its entirety for all purposes.

TECHNICAL FIELD

The invention relates to a steering device to be used in a vehicle. The steering device according to the invention can be used in a work vehicle such as a tractor, a combine or an operator machine. Alternatively, the steering device according to the invention can be used in a vehicle such as a car, a truck, a bus or the like.

BACKGROUND

Known tractors comprise one or more vents for directing warm air or cool air towards the driver, so that a proper temperature can be achieved inside the cab of the tractor. The vents are connected to an air distribution system through a series of conduits, which convey to the vents air at the desired temperature.

The vents are usually arranged on the dashboard behind the steering wheel.

A drawback of vents located behind the steering wheel is that the steering wheel constitutes an obstacle for air directed from the vents towards the driver. Therefore, air coming from the vents cannot reach directly the face of the driver. This can be uncomfortable especially during summer, when it is desirable to have a flow of cool air directly on the face of the driver.

Air coming from the vents located behind the steering wheel hits directly the hands of the driver while he or she is driving. The result is that, during summer, the fingers of the driver are cold, whereas his or her face is still hot. The opposite occurs during winter.

An object of the invention is to improve existing vehicles, particularly work vehicles such as tractors, combines or the like, but also standard vehicles such as cars.

Another object is to improve comfort for the driver of a vehicle, particularly as far as temperature inside the vehicle is concerned.

Another object is to ensure that air supplied by an air distribution system of a vehicle efficiently warms or cools the driver.

According to the invention, there is provided a steering device for a vehicle, comprising a steering wheel including a central part arranged for facing a driver and a rim that can be rotated in order to steer the vehicle, characterized in that the steering wheel further comprises air dispensing means for directing a flow of air towards the driver.

Owing to the air dispensing means, warm or cool air directed towards the driver can be supplied directly from the steering wheel. Hence, the steering wheel does not anymore constitute an obstacle for the flow of air coming from an air distribution system of the vehicle.

Furthermore, there is no risk that the hands of the driver are excessively cooled or heated, due to vents provided on the dashboard at a very short distance from the driver's hands.

Finally, the flow of air coming from the air dispensing means hits directly the chest or the face of the driver, thereby allowing the warm or cool air to reach quickly the driver. This

increases comfort for the driver, who has the impression of being in a vehicle at an ideal temperature even a short time after entering the vehicle.

In an embodiment, the air dispensing means are located in the central part of the steering wheel.

In an embodiment, the central part of the steering wheel is uncoupled from the rim, so that the central part remains stationary while the rim is rotated.

This embodiment is particularly suitable for vehicles in which a hydraulic connection exists between the steering wheel and the vehicle's wheels. In this case, when the driver releases the steering wheel after turning to the left or to the right, the steering wheel never returns in a predetermined position around its rotation axis. By uncoupling the central part of the steering wheel from the rim, it is possible to ensure that the air dispensing means have the desired orientation whatever be the angular position of the steering wheel.

In an embodiment, the central part of the steering wheel is rigidly connected to the rim by at least one spoke.

This embodiment is particularly suitable for vehicles in which the steering wheel is mechanically connected to the vehicle's wheels. In this case, when the driver releases the steering wheel rim, the latter returns in a univocally determined position. Hence, there is no need to uncouple the steering wheel rim from the central part of the steering wheel in order to ensure that the air dispensing means are in a proper position.

SUMMARY OF THE INVENTION

A steering device for a vehicle, is provided, which comprises a steering wheel. The steering wheel includes a central part arranged for facing a driver and a rim that can be rotated in order to steer the vehicle, The steering wheel also has air dispensing means for directing an air flow towards the driver. The steering device also includes a conduit for conveying toward the steering wheel the air flow coming from an air distribution system of the vehicle. The central part of the steering wheel is uncoupled from the rim, so that the central part remains stationary as the rim is rotated. The conduit passes in a central hole of a gear, the gear being fixed relative to the rim for transmitting rotation from the rim to a steering shaft of the vehicle.

DETAILED DESCRIPTION OF THE DRAWINGS

The invention will be better understood and carried out with reference to the attached drawings, which show some exemplificative and non-limiting embodiments thereof, in which:

FIG. **1** is a schematic perspective view, showing a steering device for a vehicle;

FIG. **2** is a schematic perspective view, showing the steering device of FIG. **1** from the bottom;

FIG. **3** is a cross-section taken along a central longitudinal plane of the steering device of FIG. **1**;

FIG. **4** is a perspective view of the steering device of FIG. **1**, in which a central plate has been removed;

FIG. **5** is a perspective view of the steering device of FIG. **1**, in which a steering wheel has been removed;

FIG. **6** is a cross-section, taken along a longitudinal plane, showing the steering device connected to a hydraulic pump of a vehicle;

FIG. **7** is a schematic perspective view, showing a steering device according to an alternative embodiment;

FIG. **8** is an exploded perspective view of the steering device of FIG. **7**, and

FIG. **9** is a cross-section similar to FIG. **3**.

DETAILED DESCRIPTION OF THE EMBODIMENT(S)

FIG. **1** shows a steering device **1** for a vehicle, particularly a working vehicle such as a tractor, a combine or the like.

The steering device **1** comprises a steering wheel provided with a steering wheel rim **2**, particularly having a circular shape. The steering wheel rim **2** can have a structure similar to known steering wheel rims, for example comprising a central core made of a metallic material such as steel. The central core can be covered with a layer of polymeric material, for example foamed polyurethane.

The steering wheel rim **2** can be rotated by an operator around a rotation axis R, shown in FIG. **3**, in order to turn the vehicle to the left or to the right. The rotation axis R is concentric with the steering wheel rim **2** and perpendicular to a plane defined by the steering wheel rim **2**.

A first bevel gear **3** is fixed relative to the steering wheel rim **2**. In particular, the first bevel gear **3** may be fastened, for example by means of screws that are not shown, to a body **4** arranged concentrically to the rotation axis R (FIG. **3**). A plurality of spokes **5** are provided, each spoke **5** extending radially to connect the body **4** with the steering wheel rim **2**, as shown in FIG. **9**.

In the shown example, three spokes **5** are provided which are arranged at angles of 120° one from another. However, it is possible to use a number of spokes different from three.

The first bevel gear **3** has a plurality of teeth arranged on a frontal face **6** thereof.

The first bevel gear **3** has a central hole **7**, clearly shown in FIG. **5**, whose function will be explained later.

Also the body **4** has a central opening which, in the assembled steering device **1**, is positioned at the central hole **7** of the first bevel gear **3**.

The steering device **1** further comprises a second bevel gear **11** for meshing directly with the first bevel gear **3**. This means that no further bevel gears are interposed between the first bevel gear **3** and the second bevel gear **11**, so that the teeth of the first bevel gear **3** engage directly with the teeth of the second bevel gear **11**.

The bevel gears **3**, **11** can be so dimensioned that the transmission ratio between the first bevel gear **3** and the second bevel gear **11** is 1:1. In this case, the number of teeth of the first bevel gear **3** is the same as the number of teeth of the second bevel gear **11**. Also the pitch diameter of the first bevel gear **3** is equal to the pitch diameter of the second bevel gear **11**.

The second bevel gear **11** has a structure which is similar to the structure of the first bevel gear **3**. In particular, the second bevel gear **11** has a frontal surface **12** on which the teeth are provided, the frontal surface **12** facing the frontal face **6** of the first bevel gear **3**.

The second bevel gear **11** also has a central hole.

The second bevel gear **11** can be mounted so as to be fixed relative to a steering shaft **13** of the vehicle, shown in FIG. **3**. For example, the second bevel gear **11** can be keyed on the steering shaft **13**, particularly at an end thereof.

The second bevel gear **11**, together with the steering shaft **13**, can be rotated around a longitudinal axis Z by the first bevel gear **3**. The steering shaft **13** extends along the longitudinal axis Z.

The longitudinal axis Z is inclined, i.e. oblique, relative to the rotation axis R. In particular, as shown in FIG. **6**, the longitudinal axis Z forms with the rotation axis R a right or an obtuse angle A, i.e. an angle which is greater than, or equal to, 90° and less than 180°.

The steering shaft **13** is included in a steering column which, as shown in FIG. **6**, further comprises a steering sleeve **38** slidingly coupled to the steering shaft **13**. An end of the steering shaft **13** opposite the first bevel gear **3** is inserted inside the steering sleeve **38** so that the steering shaft **13** can slide along the longitudinal axis Z relative to the steering sleeve **38**, without however rotating relative to the steering sleeve **38**.

The steering column is at least partially housed inside a sleeve **14**. Bearings **15**, for example of the ball type, can be interposed between the steering column and the sleeve **14**, as shown in FIGS. **3** and **6**. The steering shaft **13**, together with the steering sleeve **38**, can thus rotate relative to the sleeve **14**.

A supporting element **16** is provided for rotatingly supporting the first bevel gear **3**. The supporting element **16** can be connected to the sleeve **14**.

The supporting element **16** is hollow and has a first end **70** and a second end **71**. The first end **70** and the second end **71** are open, so that a passage is defined in the supporting element **16**. The supporting element **16** can be made of metal, particularly aluminium, and can be obtained by pressure die-casting.

As shown in FIG. **2**, the supporting element **16** partially encircles the second bevel gear **11**.

Furthermore, as shown in FIG. **3**, a portion **72** of the supporting element **16** occupies a space defined between the first bevel gear **3** and the second bevel gear **11**.

At the first end **70** of the supporting element **16** a cylindrical edge is obtained, which is arranged coaxially with the first gear **3** at the central hole **7** thereof. For example, the cylindrical edge provided at the first end **70** can project inside the first gear **3**. This cylindrical edge carries a supporting bearing **18** for rotatingly supporting the first bevel gear **3**. In particular, an inner ring of the supporting bearing **18** is fixed relative to the supporting element **16** and an outer ring of the supporting bearing **18** is fixed relative to the first bevel gear **3**.

Owing to the supporting bearing **18**, the first bevel gear **3** can be rotated while the supporting element **16** remains stationary.

The second end **71** of the supporting element **16**, opposite the first end **70**, can be connected to a tubular element **19**, shown in FIG. **3**.

The steering device **1** further comprises a containing element **20** for containing electronic devices and other accessories associated to the steering wheel. The containing element **20** can be fastened to the supporting element **16**, particularly at the first end **70** of the supporting element **16** which carries the supporting bearing **18**.

The containing element **20** can be made of metal, particularly aluminium, or of plastics, particularly glass reinforced plastics.

The containing element **20** has a central opening which, in use, is aligned with the central hole **7** of the first bevel gear **3** and with the open first end **70** of the supporting element **16**.

The steering device **1** further comprises a central part or panel **10** which, during use, faces the operator in the driving position. The central panel **10** is arranged at a location surrounded by the steering wheel rim **2**, particularly concentrically with the steering wheel rim **2**.

The central panel **10** can be defined on a covering element **21** associated to the containing element **20** in order to close the containing element **20**. The covering element **21** may be removably fixed to the containing element **20**, for example by fastening elements such as screws.

As shown in FIG. **3**, the covering element **21** may have a side wall **8** projecting from the central panel **10** and suitable for contacting the containing element **20** so as to keep the central panel **10** at a distance from the containing element **20**.

A plurality of control devices are located on the central panel **10**. For example, the control devices might comprise a display **22** arranged in a central region of the central panel **10** for displaying information concerning the current status and working conditions of the vehicle. The display **22** may be a touch-screen display, in which case the operator is not only able to read information displayed on the control display **22**, but can also input data or commands for the vehicle.

The control devices located on the central panel **10** may also comprise switches or push-buttons, for example a start-stop button **23** for starting or stopping an engine of the vehicle, or an emergency button **24**.

The above mentioned control devices can also comprise one or more warning lights located in a region **25** of the central panel **10**.

In addition, or as an alternative, to the control devices which have been described above, the central panel **10** can comprise dispensing means **26** for sending a flow of air towards the operator. The flow of air may be a flow of warm air, which has been heated by a heating device not shown. As an alternative, the flow of air may be a flow of fresh air, particularly cooled by a cooling device to be activated in hot seasons.

The dispensing means **26** can comprise a grid **27** arranged at a location on the central panel **10**, particularly in a region of the central panel **10** which, in use, is proximal to the operator. A rotatable knob **28** may be associated to the grid **27** for changing orientation of the grid **27** to direct the flow of air in a desired direction. For example, during summer the operator may appreciate receiving a flow of fresh air in his face, whereas during winter the operator may choose to direct the flow of warm air towards his chest. The flow of air may also be directed towards the operator's fingers while the operator is holding the steering wheel rim **2**.

As shown in FIG. **4**, in which the covering element **21** has been removed for the sake of clarity, inside the containing element **20** a partition wall **29** may be provided for defining in the containing element **20** a compartment **30** and a chamber **31**.

The chamber **31** may be positioned, in use, below the grid **27** so as to distribute the flow of air coming from the heating device or the cooling device towards the operator. The chamber **31** is at least partially open at the top thereof.

A conduit **32** opens into the chamber **31** to put the chamber **31** in fluid communication with a distribution system which distributes warm or cooled air inside the vehicle. The conduit **32** is defined by the central opening of the containing element **20**, by the passage defined internally of the supporting element **16** and by the tubular element **19**.

The compartment **30** defined in the containing element **20** houses certain electric components that are necessary in order that the control devices provided in the central panel may work properly. In particular, the compartment **30** houses wires, circuits and supports associated with the control devices.

Further electric components associated to the above mentioned control devices may be housed in a recess **73** defined inside the covering element **21**.

An electrical cable **33** terminates in the compartment **30** so as to connect the control devices located on the central panel **10** with an electrical power source, for example a battery of the vehicle.

The cable **33** passes through the tubular element **19**, the supporting element **16** and the central opening made in the containing element **20**. The cable **33** arrives in the compartment **30** through a hole obtained in the partition wall **29**.

The supporting element **16**, as illustrated in FIGS. **3** and **9**, has therefore a plurality of functions, namely:

- rotatingly supporting the first bevel gear **3** by means of the supporting bearing **18**;
- positioning the first bevel gear **3** relative to the second bevel gear **11** or to the steering shaft **13**;
- supporting the containing element **20**, so that the containing element **20** remains stationary as the steering wheel rim **2** rotates;
- providing a passage for the flow of air directed towards the dispensing means **26**, so as to convey the flow of air along a predetermined path;
- providing a passage for the electrical cable **33**, so as to avoid interference between the electrical cable **33** and the bevel gears **3**, **11**.

An axial adjusting device **34** can be provided for adjusting the position of the steering wheel along the longitudinal axis Z, according to the operator's needs. The axial adjusting device **34** can comprise a gas spring **35** for example of the kind having a lock position. The gas spring **35** has a first end **36** connected to the sleeve **14**. A second end **37** of the gas spring **35**, opposite the first end **36**, is connected to a frame of the vehicle.

The gas spring **35** can be lengthened or shortened by displacing the first end **36** parallel to the longitudinal axis Z. When this occurs, the sleeve **14**, as well as the steering shaft **13** supported by the sleeve **14**, are displaced together with the first end **36** along the longitudinal axis Z. The bevel gears **3**, **11**, the steering wheel and the components associated thereto are consequently moved far away from, or close to, the operator, until the desired position has been reached.

While adjusting the axial position of the steering shaft **13**, the latter can slide relative to the steering sleeve **38**.

As the axial position of the steering shaft **13** varies, the length of the tubular element **19** is also modified. A compensation element is associated to the tubular element **19** allowing the length of the tubular element **19** to be modified, in order to compensate for variations in the axial position of the steering shaft **13**. As shown in FIG. **1**, the compensation element may comprise a bellows **39** obtained in a side wall of the tubular element **19**.

As shown in FIG. **6**, a tilt adjusting device **40** can be provided for adjusting tilting of the steering column, so that the steering wheel can be positioned at a selected angle relative to the ground, or more precisely relative to the floor of the vehicle. This angle is chosen so that the operator sits comfortably on the vehicle during driving.

The tilt adjusting device **40** may comprise a tilt adjusting gas spring **41**, for example having a lock position. The tilt adjusting gas spring **41** may have an end **42** connected to a support **43** which supports the steering column. A further end **44** of the tilt adjusting gas spring **41** may be connected to the frame of the vehicle.

By acting on the tilt adjusting device **40**, the tilt adjusting gas spring **41** may be lengthened or shortened and the end **42** can be moved away from, or close to, the further end **44**. Tilt of the steering column, and particularly of the steering shaft **13**, can thus be modified according to the operator's wishes.

The operator may act on the tilt adjusting device **40** by acting on a pedal **45** shown in FIG. **6**. The pedal **45** may be connected to the tilt adjusting gas spring **41**. By acting on the pedal **45**, the operator can thus change the angle between the steering shaft **13** and the ground.

In an embodiment, the pedal **45** may also allow the operator to modify axial position of the steering shaft **13**. In this case, the pedal **45** is connected to the gas spring **35** of the axial adjusting device **34**. By acting on the pedal **45**, the operator can thus control both inclination and axial position of the steering shaft **13**.

In another embodiment, the axial adjusting device **34** may be controlled by a control element different from the pedal **45**, for example by another pedal or a lever.

As shown in FIG. **6**, the steering device **1** can be included in a hydraulic power steering system in which a hydraulic fluid is used to steer the vehicle's wheels. In this case, a pump **46** is provided for sending the hydraulic fluid towards the vehicle's wheels. By applying a torque on the steering wheel, the operator operates a plurality of valves to control flow of the hydraulic fluid.

The steering shaft **13** and the steering sleeve **38** may be configured to operate on the pump **46** through an interposed shaft **47** connected to the steering sleeve **38** by a universal joint **48**.

During use, the operator acts on the steering wheel by rotating the steering wheel rim **2** clockwise or counter-clockwise around the rotation axis R. The body **4**, which is connected to the steering wheel rim **2** by the spokes **5**, is consequently rotated. The first bevel gear **3**, which is fixed to the body **4**, is also rotated around the rotation axis R. The first bevel gear **3** is supported during rotation by the supporting bearing **18**, provided on the supporting element **16**. The latter remains still.

The first bevel gear **3** engages the second bevel gear **11** thereby rotating the second bevel gear **11** around the longitudinal axis Z. The second bevel gear **11** in turn rotates the steering shaft **13** and more in general the steering column, which causes the vehicle's wheels to steer to the desired direction.

The steering column is supported during rotation by the bearings **15**, mounted inside the sleeve **14** which remains still.

When the operator rotates the steering wheel rim **2**, the central panel **10** remains still. This occurs because the central panel **10** is mounted on the containing element **20**, which in turn is supported by the supporting element **16**. As already explained, the latter is not rotated by acting on the steering wheel rim **2**.

The operator can easily see the control devices located on the central panel **10**, and act on them, in any position of the steering wheel rim **2**, since the position of these control devices is not affected by rotation of the steering wheel rim **2**. In particular, the operator can easily input data and instructions to the control display **22**, if the latter is a touch-screen display. If the control display **22** were located on the dashboard, interacting with the control display would be much more complicated for the operator.

Since the central panel **10** is easily reachable and visible, comfort for the operator is increased, because the operator does not have to move the upper part of his or her body in order to see or act on the control devices. If on the other hand the control devices were located behind the steering wheel on the dashboard, as frequently occurs in known vehicles, the operator would have to tilt his or her body forward in order to see or reach these control devices.

Furthermore, it is possible to reduce the risk that the operator may temporarily lose control of the vehicle while trying to reach control devices located on the dashboard far away from his or her body.

The operator can also act on a heating system or conditioning system of the vehicle and have warm air or cool air distributed by the dispensing means **26**. Since the latter are associated to the central panel **10**, rotation of the steering wheel rim **2** does not influence quantity or direction of the dispensed air.

In an embodiment which is not shown, only control devices could be provided on the central panel **10**. In other words, the dispensing means **26** could be missing.

In another embodiment, only the dispensing means **26** could be provided on the central panel **10**, whereas the control display **22**, the buttons **23**, **24** and the warning lights are missing.

FIGS. **7** and **8** show a steering device **101** according to an alternative embodiment. The steering device **101** is particularly suitable for vehicles such as cars, trucks, buses or the like, in which there is a mechanical connection between the steering wheel and the vehicle's wheels. In this case, the position of the steering wheel when the vehicle is travelling in a straightforward direction is univocally determined. Hence, there is no need to uncouple the steering wheel rim from the central part of the steering wheel.

The steering device **101** comprises a steering wheel rim **102** connected to a central part **110** of the steering wheel by spokes **105**. The central part **110** is fixed relative to the steering wheel rim **102**.

On the central part **110**, dispensing means **126** are provided for dispensing a flow of air towards the driver. The flow of air can be either warm or cool according to the driver's preferences, i.e. depending on whether the driver has turned on a heating device or a cooling device of the vehicle.

The dispensing means **126** may comprise a grid **127** arranged at a desired location on the central part **110**, for example in a lower region of the central part **110** close to the steering wheel rim **102**.

As shown in FIG. **8**, the dispensing means **126** further comprise a passage **50** obtained through the thickness of the central part **110** for bringing the flow of air towards the grid **127**. The passage **50** extends from the grid **127** to a back surface **56** of the central part **110**.

A distributor element **51** is further provided for delivering air to the dispensing means **126**. The distributor element **51** may comprise a conduit **52** which is fixed relative to a frame of the vehicle and is in fluid communication with the air distribution system of the vehicle.

The distributor element **51** may comprise a flange **53**, for example having a circular shape. A hole is provided in a central region of the flange **53**.

The steering device **101** further comprises a steering shaft **113** connected to the steering wheel, so that the steering shaft **113** is rotated by rotating the steering wheel. The steering shaft **113** passes through the hole of the flange **53** and can rotate relative to the flange **53**.

An elastic element **54** can be interposed between the flange **53** and an anti-friction disc **55**. The anti-friction disc **55** is made of a material having a low coefficient of friction and is intended to be contacted by the back surface **56** of the steering wheel. When the steering wheel is rotated, the back surface **56** slides in contact with the anti-friction disc **55**. This reduces friction that must be overcome to rotate the steering wheel.

Both the anti-friction disc **55** and the elastic element **54** have a central hole through which the steering shaft **113** passes. A through opening **57** is made in the anti-friction disc **55** and a further through opening **58** is made in the elastic element **54**. The through opening **57** and the further through opening **58** have a shape which approximately corresponds to the shape of the cross section of the conduit **52**.

In the assembled steering device **101**, the through opening **57** and the further through opening **58** are aligned with the conduit **52**. The through openings **57**, **58** are also aligned with

the passage **50**, when the steering wheel is in its rest position corresponding to the vehicle advancing along a straight direction.

The flow rate of the air sent towards the driver's body is maximum when the vehicle is advancing along a straight direction, in which case substantially the whole cross section of the passage **50** faces the through opening **57**. When the steering wheel is rotated, communication between the passage **50** and the conduit **52** is reduced or even temporarily interrupted. However, as soon as the steering wheel is returned to its rest position, a full flow of air towards the operator's body is re-obtained. Comfort for the operator can therefore be kept at good levels.

The invention claimed is:

1. A steering device for a vehicle, comprising:

a steering wheel including

a central part arranged for facing a driver and a rim that can be rotated in order to steer the vehicle; and

air dispensing means for directing an air flow towards the driver;

a conduit for conveying toward the steering wheel the air flow coming from an air distribution system of the vehicle,

wherein the central part of the steering wheel is uncoupled from the rim, so that the central part remains stationary as the rim is rotated,

wherein the conduit passes in a central hole of a gear, the gear being fixed relative to the rim for transmitting rotation from the rim to a steering shaft of the vehicle, and

wherein the air dispensing means are located on the central part of the steering wheel.

2. The steering device according to claim **1**, wherein the air dispensing means comprise a grid, an adjusting element being preferably provided for adjusting orientation of the grid.

3. The steering device according to claim **1**, further comprising a containing body uncoupled from the rim and a covering element closing the containing body, the central part being defined on the covering element.

4. The steering device according to claim **3**, wherein the conduit opens in a chamber defined in the containing body.

5. The steering device of claim **1**, further comprising at least one control device located in the central part for controlling the vehicle during operation.

6. The steering device according to claim **5**, wherein the containing body comprises a partition wall for dividing the chamber from a compartment which houses at least partially the control device.

7. The steering device according to claim **6**, wherein an electric cable passes through the conduit, the electric cable being connected to the control device.

8. The steering device according to claim **1**, wherein the air dispensing means further comprise a passage obtained in the central part of the steering wheel, the passage being in fluid communication with the conduit through a cross section having an area which varies as the rim is rotated relative to the conduit.

9. The steering device according to claim **1**, further comprising an axial adjusting device for adjusting distance between the steering wheel and the driver and/or a tilt adjusting device for adjusting tilting of the steering wheel relative to a floor of the vehicle.

10. The steering device according to claim **9**, wherein the axial adjusting device comprises a length compensation element including a bellows, the length compensation element being provided along the conduit for allowing length of the conduit to be varied.

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